

10/539328

Rec'd PCT/PTO 15 JUN 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
1 July 2004 (01.07.2004)

PCT

(10) International Publication Number
WO 2004/055854 A1

(51) International Patent Classification⁷: **H01J 31/12, 29/46, 29/48**

(21) International Application Number: **PCT/IB2003/005145**

(22) International Filing Date: **12 November 2003 (12.11.2003)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data: **02080436.5 17 December 2002 (17.12.2002) EP**

(71) Applicants (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL). LG PHILIPS DISPLAYS NL [NL/NL]; Zwaanstraat 2A, NL-5651 CA Eindhoven (NL).**

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VAN DER POEL, Willibrordus, A., J., A. [NL/NL]; c/o Zwaanstraat 2A, NL-5651 CA Eindhoven (NL). VAN ZUTPHEN, Tom [NL/NL]; c/o Zwaanstraat 2A, NL-5651 CA Eindhoven (NL). WIERENGA, Harm, A. [NL/NL]; c/o Zwaanstraat 2A, NL-5651 CA Eindhoven (NL). DEEBEN, Josephus, P., A. [NL/NL]; c/o Zwaanstraat 2A, NL-5651 CA Eindhoven (NL). COSMAN, Edward, C. [NL/NL].**

(81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SI, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**

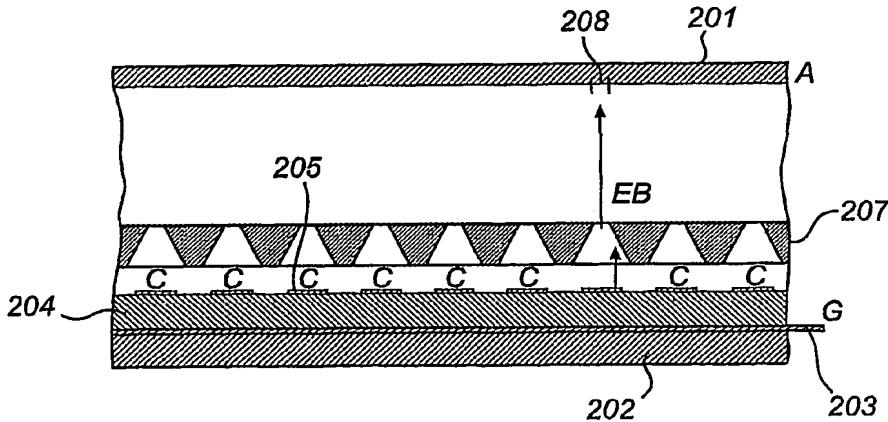
(84) Designated States (regional): **ARIPO patent (BW, GI, GM, KE, LS, MW, MZ, SD, SI, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **DISPLAY DEVICE**



WO 2004/055854 A1

(57) Abstract: The invention relates to a display device having under-gate emitters, i.e. emitters where the gates (203) are arranged under the cathodes (205), beneath an insulating layer (204). In order to protect the emitters from a high electric field from an anode (A), an electron guidance element (207) is placed between the emitters and the anode. This allows a relatively low voltage swing to be used for controlling the electron emission from the emitters from the on-state to the off-state.